

Notice of Allowability

Application No.

09/895,925

Examiner

Chih-Ching Chow

Applicant(s)

GAGNER, MARK

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/21/06.
2. ☒ The allowed claim(s) is/are 1-18.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ Including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ Including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948).
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 5/12/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 6/16/06.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Examiner's Amendment and Statement of Reasons for Allowance

1. This action is responsive to Applicant's amendment filed April 21, 2006.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Michael J. Wallace, Registration Number 44,486, on June 16, 2006 for obviating any potential 101 issues and put the claims in condition for allowance, see Interview Summary dated 6/16/2006.

The application has been amended as follows (also see attached facsimile dated 6/16/2006):

1. (Currently Amended) A controller for use in an heating, ventilation and air conditioning (HVAC) system for executing a block program to control at least one device in said system comprising:
 - a block table listing a plurality of records corresponding to a plurality of blocks in the block program provided in said controller;
 - a block library provided in said controller for holding a plurality of algorithms for executing functions associated with said blocks;
 - a block execution engine for executing said blocks in said block program in accordance with said associated algorithms; and
 - wherein said block execution engine selectively executes said blocks in the block program only when said block execution engine determines a new input value exists which is different from a previous input value to control said at least one device in said system.

2. (Previously Presented) The controller as defined in claim 1 further including an execution image file for storing descriptions of said blocks and connections between said blocks.
3. (Previously Presented) The controller as defined in claim 1 further including means for inputting/outputting data to and from said block execution engine.
4. (Previously Presented) The controller as defined in claim 1 wherein each of said records in said block table includes a field indicating whether a corresponding one of said blocks is to be executed by said block execution engine.
5. (Previously Presented) The controller as defined in claim 4 wherein each of said records in said block table further includes,
 - a field for indicating the type of function performed by said corresponding one of said blocks; and
 - a field for identifying said corresponding one of said blocks.
6. (Previously Presented) The controller, as defined in claim 5 wherein each of said records in said block table further includes,
 - at least one field for identifying at least one output connector connected to said corresponding one of said blocks.
 - at least one field for identifying at least one input connector connected to said corresponding one of said blocks,
 - at least one field for storing an input value of said corresponding one of said blocks, and
 - an output value field for storing an output value of said corresponding

one of said blocks.

7. (Previously Presented) The controller as defined in claim 1 further including a connector table listing a plurality of records of a plurality of connectors for operatively connecting said blocks.

8. (Previously Presented) The Controller as defined in claim 7 wherein each of said records in said connector table includes a field identifying one of said blocks to which a corresponding connector is connected at a first end, and at least one field for identifying at least one of said blocks to which said corresponding connector is connected at a first end, and at least one second end.

9. (Previously Presented) A computer-implemented method for executing a block program for controlling at least one device in an heating, ventilation and air conditioning (HVAC) system using a controller, comprising the steps of:

- creating a block table of plurality of block records in the controller that correspond to a plurality of blocks used in the block program;

- creating a library in the controller for holding a plurality of algorithms for executing functions associated with said blocks;

- selectively setting a flag in said block records directly in response to when at least one input value of corresponding said blocks changes; and executing said algorithms of said blocks in said block program having corresponding block records mat have said flag set to control said at least one device in said system.

10. (Previously Presented) The method as defined in claim 9 further including

the step of creating a connector table of records that correspond to connectors for operatively connecting said blocks.

11. (Previously Presented) Re method as defined in claim 10 further including the step of subsequently setting a flag in said records corresponding to said blocks that are connected to at least one output of said blocks that have been executed, if a value of said at least one output of said executed blocks has changed.

12. (Previously Presented) The method as defined in claim 11 wherein said step of subsequently setting said flag includes the steps of obtaining an identification of a connector corresponding to said at least one output of said execute blocks from said block records corresponding to said executed blocks, and obtaining an identification of blocks that are connected to said connector.

13. (Previously Presented) The method as defined in claim 10, wherein said block table and said connector tables are created from an execution image file storing said records for said blocks and said connectors.

14. (Previously Presented) The method as defined in claim 9 wherein said executing step is performed at every predetermined time interval.

15. (Previously Presented) The method as defined in claim 9 wherein said records in said block table are listed in an order corresponding to a predetermined order in which said blocks are adapted to be executed in said block program.

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16. (Previously Presented) The method as defined in claim 15 wherein said executing step includes a step of checking each record in said block table in said listed order for said block records having said flag set.

17. (Currently Amended) A computer-implemented controller for use in an heating, ventilation and air conditioning (HVAC) system having a block program for controlling at least one device in said system, comprising:

a block table, provided in said controller, listing a plurality of records corresponding to a plurality of function blocks in the block program, said blocks each having at least one input for receiving an input value and at least one output for outputting an output value;

a connector table listing records of connectors for operatively connecting said blocks;

a block library for holding algorithms associated with said blocks; and,

a block execution engine for executing said blocks in said block program in accordance with said associated algorithms;

wherein said block execution engine selectively executes said blocks in the block program only when said block execution engine determines a new input value is present which is different from a previous input value, wherein at least one device in said system is controlled in response to said block execution engine selectively executing a block.

18. (Previously Presented) The controller as defined in claim 17 further including means for inputting data to said block execution engine from the devices and the system , and outputting data to me devices and the system from said block execution engine.

-- The End --

Examiner's Statement of Reason(s) for Allowance

3. Claims 1-18 are allowed.

4. The following is an examiner's statement of reasons for allowance:

The prior arts of record: **Newman**, teaches a method of a block diagram simulator using a library for generation of a computer program, each block corresponds to a software procedure for performing at least one function and has at least one input or at least one output; **Cameron**, teaches an invention of pertains to a task scheduling system in a multicomputer having nodes arranged in a network; **Kaiser et al.**, teaches An environmental control system for use in a greenhouse or another structure which requires the control of an ambient condition regulating element in response to a plurality of sensed parameters; **Smith et al.**, teaches an improved building automation system is provided which is modular in design thus minimizing the amount of instruction necessary to affect control of a particular building system; **Barrett**, teaches a highly distributed direct digital process control system for use in controlling a fully distributed process includes at least one device controller independently monitoring and controlling a plurality of external devices for performing a complete process. And new arts made of record: U.S. Patent No. 6,944,584 by **Tenney**, teaches a simulation and control system, which allows developers to write control and simulation programs for controlling devices using object-oriented and graphical programming; US Patent No. 4,240,137 by **Matsumoto et al.**, teaches a computer which executes a program made up of a plurality of blocks comprises a program counter which designates an address of an instruction to be executed, first and second registers that stores entry addresses of first and second blocks respectively of the program, and a push down stack that stores an entry address of a third block of the program; and JP 01057304 A by **Maruyama et al.**, teaches a method to express a controlled system to be complexly operated by arranging a control element on the screen of a display device and registering optional control operation as a new control element.

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However, none of them, taken alone or in combination (as indicated in REMARKS/ARGUMENTS dated 04/21/2006, pages 6-7) teaches the limitations of a method for a computer-implemented controller for use in an HVAC (heating/ventilation/air conditioning) system for executing a block program to control at least one device which comprising: a block table listing a plurality of records corresponding to a plurality of blocks in the block program provided in said controller; a block library provided in said controller for holding a plurality of executing functions associated with said blocks; a block execution engine for executing said blocks in said block program in accordance with said associated algorithms; and input value changes corresponding to the block program, in such a manner as recited in independent claims 1, 9, and 17; and a block execution engine for executing said blocks in said block program in accordance with said associated executing functions; and wherein said block execution engine selectively executes said blocks in the block program only when said block execution engine determines a new input value exists which is different from a previous input value to control said at least one device in said system, in such a manner as recited in independent claims 1 and 17; and selectively setting a flag in said block records directly in response to when at least one input value of corresponding said blocks changes, and executing said algorithms of said blocks in said block program having corresponding block records that have said flag set to control said at least one device in said system as recited in independent claim 9.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Ching Chow whose telephone number is 571-272-3693. The examiner can normally be reached on 7:00am - 3:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

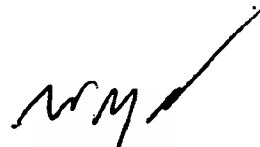
Chih-Ching Chow

Examiner

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June 16, 2006

CC



WEI ZHEN
SUPERVISORY PATENT EXAMINER